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ECHINODERMS FROM THE BAHAMA ISLANDS.

BY J. E. IVES.

In the years 1887 and 1888, Mr. Frederick Stearns of Detroit, made a collection of Invertebrates in the Bahama Islands. He collected upon Andros and other islands near Nassau. The following list represents the Echinoderms obtained by him. It includes a description of a new species of *Amphiura*. The accompanying plate has been prepared for publication through Mr. Stearns' liberality.

ECHINOIDEA.

Cidaris tribuloides Lamarck.

Numerous specimens collected.

Echinometra subangularis Leske.

Numerous specimens found in living sponges, in three fathoms of water, on the west side of Andros Island.

Toxopneustes variegatus Lamarck.

Hipponoe esculenta Leske.

Numerous specimens collected.

Echinanthus rosaceus Linnæus.

A single specimen collected.

ASTEROIDEA.

Astropecten articulatus Say. Pl. XVI, figs. 4–8.

Asterias articulata Say, Journ. Acad. Nat. Sci. Phila. (1), vol. V, p. 141, 1825; Müller und Troschel. System der Asteriden, p. 72, 1842; Dujardin et Hupé, Suites à Buffon, Echinodermes, p. 419, 1862; Lütken, Vidensk. Meddel. pp. 127–129, 1864; Perrier, Arch. Zool. Expér. t. 5, pp. 290–291, 1878, (pars.)

A single specimen of this species was collected.

Two such eminent authorities as Dr. Lütken and Professor Alexander Agassiz[1] have differed as to the identification of Say's species. Professor Perrier in the "Revision des Stellérides," has given Professor Agassiz's *A. articulatus* as synonymous with Dr. Lütken's *A. articulatus*, but a comparison of Professor Agassiz's figures with Dr. Lütken's description, at once shows the difference between the two forms. Say's description, in my opinion, would refer more precisely to the form described by Dr. Lütken, than to that described by Professor Agassiz. Say states that the species he described " is very common on the coast of East Florida and on the sea Islands of Georgia." My friend Mr. C. W. Johnson, who has collected for eight years at St. Augustine, on the east coast of Florida, informs me that the form described by Lütken is the only species of *Astropecten* which he has found in that region. There appears to me, therefore, to be very little doubt that this is the form originally described by Say.

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[1] Mem. Mus. Comp. Zool. Vol. V, pp. 114–116, Pl. XIX.

The species figured by Professor Agassiz as *Astropecten articulatus* Say, I believe to be the *Astropecten duplicatus* of Gray.[1]

Prof. Perrier has included *A. dubius* Gray under the synonymy of *A. articulatus*, but this species is undoubtedly distinct from *A. articulatus* Say, as defined by Dr. Lütken, and is probably identical with *A. duplicatus* Gray.

Below is given a translation of Dr. Lütken's careful description of *A. articulatus.* In addition to this it may be said that in the living animal the upper side-arm-plates are orange-colored, the paxilla-area of the disk and arms purple, and the side-arm-spines purple.

" Of quite considerable size, (about 6 inches in diameter), with rather long and pointed arms. Proportion between the radii about as 1: 4. Arm angles acute. Edge-plates about 50. In the middle of the arms the paxilla-belt is still twice as wide as the edge-plates; the paxillæ, whose structure and arrangement are as usual on the disk, become larger and are composed of larger grains; in the middle of the disk they became again smaller and more delicate. The madreporic plate lies nearer to the edge-plates than to the middle of the disk. The upper edge plates are covered with grains, which become fine and bristle-like around the edges of the plates. On the outer half of the arm there may appear on each of these plates, a little low spine or protuberance. It is not unusual for it to be missing on one or another plate, or on several successive plates, but it is very unusual for it to go beyond the middle of the arm. I dare not assert positively that it can be absent entirely, as it may, perhaps, have been only lost through wear, in the examples in which I have not been able to convince myself of its existence. The lower edge-plates are closely covered with small spines of somewhat diverse size; the finest small bristles are situated around their edges; the largest form a transverse row along the aboral edge, and constitute a transition to the two rather short and weak, somewhat curved, horizontal edge-spines placed side by side, with which each plate is provided. The foot-papillæ usually form two rows; in the inner row are three slender spines in a group, of which the innermost is the longest and somewhat curved; in the outer row are two broad, flat, low, equally truncated, spade-formed papillæ side by side, of which the one nearest to the mouth (the adoral) in all respects stands behind the other; more rarely there are three papillæ in this row. Outside of it, there are, as a rule, in addition, 1–3 small papillæ, which in the neighborhood of the mouth become larger and more numerous, so that 7–8 can be counted in each group besides the 3 or 4 which belong to the inner row. Mouth plates covered closely by scale-like papillæ."[1]

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[1] See Prof. Perrier, Arch. Zool. Expér. pp. 271–272.

In my paper entitled " Echinoderms from the northern coast of Yucatan and the harbor of Vera Cruz," Proc. Acad. Nat. Sci. Phila. 1890, pp. 330–331, I identified an Astropecten, collected at Vera Cruz, as *Astropecten articulatus* Say, on account of its resemblance to Prof. Agassiz's figures. If, as assumed above, the true *A. articulatus* Say is the form described by Lütken, then the specimen collected at Vera Cruz is the *A. duplicatus* Gray.

Astropecten duplicatus Gray.

Luidia clathrata Say.

A single specimen collected.

Pentaceros reticulatus Linnæus.

A single specimen collected.

Linckia Guildingii Gray.

Echinaster spinosus Retzius.

A single specimen collected.

OPHIUROIDEA.

Ophiura cinerea Muller und Troschel.

A single specimen collected.

Ophiactis Mülleri Lutken.

Numerous specimens found in sponges on Andros Bank.

Amphiura Stearnsi n. sp. Pl. XVI, figs. 1–3.

Disk angular, outer edge of the interbrachial spaces strongly concave; covered above and below with fine scales, some larger scales are found in the brachial spaces. Radial shields of moderate length, very narrow, widely separated by the scales of the disk, parallel with each other. Mouth shields large, sub-pentagonal, one of the angles directed towards the mouth, widest at the aboral edge, aboral edge convex, lateral edges slightly concave. Side-mouth-shields pyriform, the angle directed inwards and towards the mouth shield. Mouth papillæ usually ten to each angle, the second and third counting from without inwards, the largest, angular; the fourth and fifth more slender, rounded; the first or outermost small and angular.

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[1] I wish to express my indebtedness to Mr. Fred. F. Myhlertz, the Danish Consul in Philadelphia, for having examined this translation for me.

Arms long, about ten times as long as the diameter of the disk. Upper-arm-plates sub-triangular, the apex of the triangle pointing towards the end of the arm, and much rounded off. Lower-arm-plates quadrilateral, the aboral and lateral edges slightly concave. Side-arm-plates about as high as the width of the upper-arm-plates; meeting neither above nor below. Three stout arm-spines about as long as the upper-arm-plates. One large oblong tentacle scale, about two-thirds of the length of the under-arm-plate.

General color of the dried specimen described, white; dorsal surface of the arms with a dark mottled band upon every fourth plate.

In the specimen described, diameter of the disk 5·5 mm., and length of an arm about 50 mm.

This species is characterized by the fine scaling of the disk, with the interspersed larger rounded scales; the very narrow and widely separated radial shields; the banded arms; the single large tentacle scale, and the five mouth papillæ on each side of the mouth angle. It approximates *Amphiura nereis*[1] and *Amphiura tumida*[2] but differs among other things in the single large tentacle scale and the widely separated radial shields.

A single specimen found in a living sponge on Andros Bank.

Ophiothrix Oerstedii Lutken.

Numerous specimens found in living sponges on Andros Bank.

Astrophyton costatum Lyman.

A single specimen sent to Mr. Stearns from the Bahamas.

EXPLANATION OF PLATE XVI.

Fig. 1. *Amphiura Stearnsi* n. sp. Portion of the dorsal surface of the disk and arms, much enlarged.

Fig. 2. Portion of the ventral surface of the disk and arm, much enlarged.

Fig. 3. Portion of the lateral surface of an arm near its base, much enlarged.

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[1] Lyman, Bull. Mus. Comp. Zool. Vol. X, p. 250, Pl. V, figs. 61–63.

[2] Lyman, op. cit. Vol. V. p. 225, Pl. II, figs. 28–30.

Fig. 4. *Astropecten articulatus* Say. Dorsal surface, natural size.

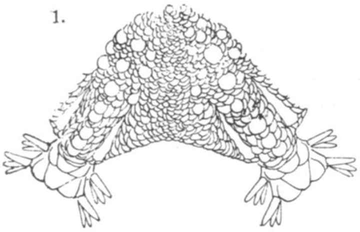
Fig. 5. Ventral surface, natural size.

Fig. 6. Portion of dorsal surface of an arm, at about one-third of the distance from its base, enlarged.

Fig. 7. Portion of lateral surface of an arm, near its base, enlarged.

Fig. 8. Portion of ventral surface of an arm, at about one-third of the distance from its base, enlarged.

1.



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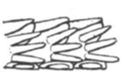

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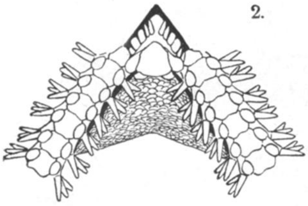

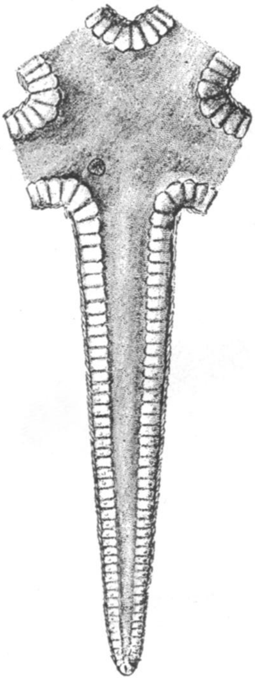

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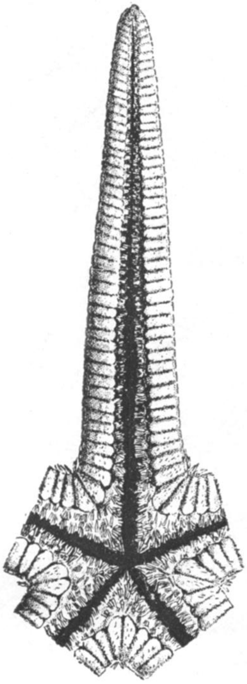

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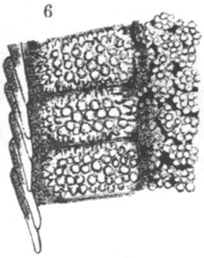

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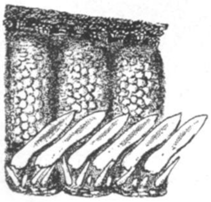

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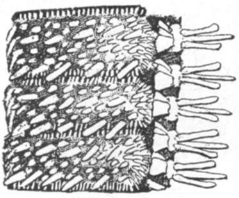

J. E. Ives, del.

IVES, BAHAMA ECHINODERMS.